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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/528,713	08/11/2005	Louis Fouarge	F-858 (31223.00075)	8448
25264	7590	12/04/2007	EXAMINER	
FINA TECHNOLOGY INC PO BOX 674412 HOUSTON, TX 77267-4412			CHEUNG, WILLIAM K	
			ART UNIT	PAPER NUMBER
			1796	
			MAIL DATE	DELIVERY MODE
			12/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/528,713

Applicant(s)

FOUARGE ET AL.

Examiner

William K. Cheung

Art Unit

1796

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10/30/07.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 17-34 and 36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 17-34 and 36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the argument filed October 30, 2007, the amendment filed October 30, 2007 has been entered.
2. In view of the amendment of October 30, 2007, claim 35 has been cancelled.
Claims 17-34, 36 are pending.
3. In view of the amendment of October 30, 2007, the objection of Claims 25-33 due to minor informalities is withdrawn. Further, the rejection of Claims 25-33 under 35 U.S.C. 112, second paragraph, is withdrawn.
4. In view of the following rejection findings, the examiner has to withdraw the allowability of claims 17-24, and 34-36.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 31-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 31 (line 3), the recitation "empty space" is considered indefinite. What is it? Is it a vacuum, just a space filled with slurry, or filled with other things? Although applicants' specification (page 4, line 29-32) has recited "empty space", it does not provide adequate disclosure on what is it.

The re-circulation is carried out by leaving an empty space between one or more blade(s) of the impeller and the shroud of the pump, said space being of the order of from 0.5 to 10 % of the pump radius and preferably of from 1 to 5 % of the pump radius.

Claim 31 (line 2), the recitation "pump shroud surrounding said impeller blades" is considered indefinite. Applicants' specification (page 4, line 29-32) discloses pump possesses a shroud. How can the shroud of the pump be surrounding the impeller blades?

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 17-28, 34, 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouzier et al. (US 3,595,846).

*The invention of claims 17-34, 36 relates to a **method of forming polyolefins** comprising:*

supplying ethylene monomer in a carrier liquid to a reactor system
*comprising at least one **loop reactor**;*

circulating the ethylene through the loop reactor in the presence of a catalyst
*system to form a **slurry of polymer fluff particles in the carrier liquid**;*

altering the flow of at least a portion of the slurry by at least one of:

flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor;

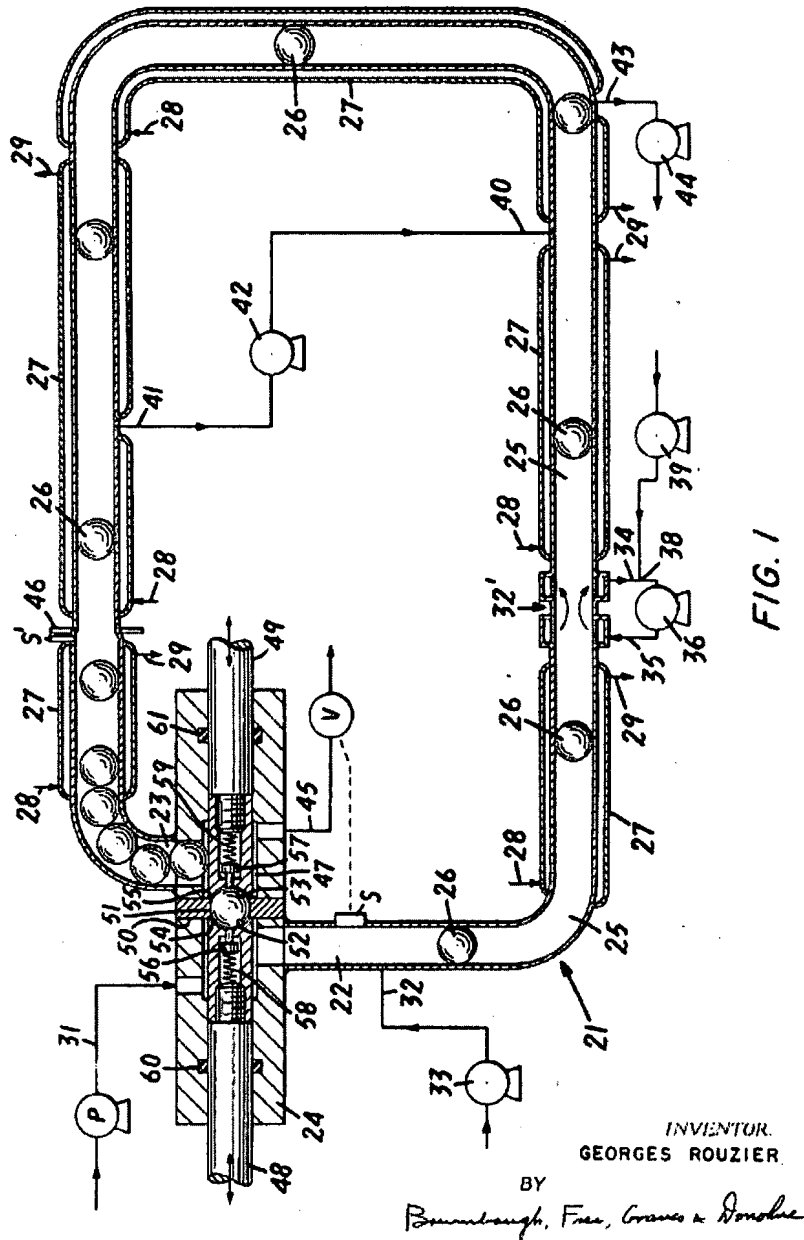
operating a circulating pump and circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity; or

providing a plurality of obstacles in a flow path of the slurry within the loop reactor; and

while continuing the introduction of the carrier liquid and ethylene monomer into the loop reactor, withdrawing a portion of the slurry from the loop reactor as a polymer product.

Rouzier et al. (Figure 1; col. 1, line 23-30) disclose a polymerization process for ethylene (col. 3, line 29) in the presence of heptane and catalyst (col. 6, line 49), where the monomer can be feed through line 31 of the reactor. Rouzier et al. (col. 3, line 51-55; col. 6, line 46-50) clearly disclose a polymerization process involving the circulation of monomers in a slurry of polymer (fluff) partitioned off by movable separators (or the obstacles as claimed). Regarding the claimed "flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor", Rouzier et al. (Figure 1; col. 6, line 51-55) disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor. Regarding the claimed "withdrawing a portion of the slurry from the loop reactor as a polymer product", Rouzier et al. (Figure 1; col. 7, line 6-8) disclose that portion of the slurry can be drawn off by

means of a pump through line 43. For circulating the slurry, Figure 1 of Rouzier et al. clearly disclose the use of pumps (item 36, 39, 42).



The difference between the invention of claims 17-28, 34, 36 and Rouzier et al. is that Rouzier et al. do not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity".

However, Rouzier et al. in Figure 1 clearly disclose the use of pumps (item 36, 39, 42). Although Rouzier et al. do not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity", it would not be difficult to one of ordinary skill in art to recognize that the pump for circulating the polymer slurry should be run at a safe range or capacity within the capability of a pump to avoid equipment failure. Motivated by the expectation of success of developing a polymerization process for polymerizing ethylene, it would have been obvious to circulate the slurry at an efficiency that is not too low or too high capacity relative to the maximum capacity of a pump to obtain the a range that fully encompasses the 30-75% of a pump capacity feature as claimed.

Regarding the difference between the invention of claims 18, 19, 26, 27 and Rouzier et al. that Rouzier et al. do not disclose the amount to be bypassed, applicants must recognize that Rouzier et al. in Figure 1 clearly disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Therefore, generically, the examiner has a reasonable basis to believe that the amount as claimed in claims 18, 19, 26, 27 is included in the amount as taught in Rouzier et al. Motivated by the expectation of

success of developing the process of Rouzier et al., it would have been obvious to one of ordinary skill in art to apply "routine experimental design" to obtain the amount feature of claims 18, 19, 26, 27. To obtain a valid patent, applicants should submit comparative data to show the criticality of the claimed amount to be bypassed of claims 18, 19, 26, 27.

Regarding the difference between the invention of claims 20-22 and Rouzier et al. that Rouzier et al. do not disclose the angle between the bypass line and the loop reactor, applicants must recognize that Rouzier et al. in Figure 1 clearly disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Although diagrammatically, the angle is between the bypass line and the loop reactor is at 90 degree. However, the examiner believes that the said angle should not be restricted by Figure 1 because it is merely a technically drawing describing a concept. However, the examiner has a reasonable basis to believe that the angle as claimed in claims 20-22 is generically taught in Figure 1 Rouzier et al. Motivated by the expectation of success of developing the process of Rouzier et al., it would have been obvious to one of ordinary skill in art to apply "routine experimental design" to obtain the angle feature of claims 20-22. To obtain a valid patent, applicants should submit comparative data to show the criticality of the claimed angles of claims 20-22.

Regarding the difference between the invention of claims 23, 24 and Rouzier et al. that Rouzier et al. do not disclose ratio DB/DL range as claimed, applicants must recognize that Rouzier et al. in Figure 1 clearly disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Since the bypass line is for pumping a portion of the slurry to be recirculated, it would not be difficult for one of ordinary skill in art to recognize that the bypass line is not required to be same diameter of the loop reactor or to have the same capacity of the loop reactor. Therefore, motivated by the expectation of success of developing the process of Rouzier et al., it would have been obvious to one of ordinary skill to employ a DB/DL ratio of less than 1 to obtain the invention of claims 23, 24. To obtain a valid patent, applicants should submit comparative data to show the criticality of the claimed range of DB/DL ratio of claims 23, 24.

Regarding the difference between the invention of claims 25-28 and Rouzier et al. that Rouzier et al. do not disclose that the recirculation of the slurry from the pressure side of the impeller blades of said pump to the suction side of the impeller blades of said pump, applicants must first recognize that Rouzier et al. in Figure 1 clearly disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Further, applicants must recognize that it is well known in the art that the pumps for this particular application are typically performed with pumps having impeller blades. While

the impellers are in action for recirculating the said slurry, the action creates a suction side and pressure side. Further, on the pressure side, the slurry is being pumped to the other side of the loop reactor to be recirculated. Portion of the recirculated slurry will be drawn to the suction side of the loop reactor.

Regarding the difference between the invention of claims 26, 27, and Rouzier et al. that Rouzier et al. do not disclose the percent of the portion of the slurry to be recirculated, applicants must recognize that Rouzier et al. in Figure 1 clearly disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Therefore, generically, the examiner has a reasonable basis to believe that the percent of the portion of the slurry to be recirculated as claimed in claims 26, 27 is included in the percent as taught in Rouzier et al. Motivated by the expectation of success of developing the process of Rouzier et al., it would have been obvious to one of ordinary skill in art to apply "routine experimental design" to obtain the percent feature of claims 26, 27. To obtain a valid patent, applicants should submit comparative data to show the criticality of the claimed percent to be bypassed of claims 26, 27.

10. Claims 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rouzier et al. (US 3,595,846), in view of Weinreich et al. (US 3,093,482).

Rouzier et al. (Figure 1; col. 1, line 23-30) disclose a polymerization process for ethylene (col. 3, line 29) in the presence of heptane and catalyst (col. 6, line 49), where the monomer can be feed through line 31 of the reactor. Rouzier et al. (col. 3, line 51-55; col. 6, line 46-50) clearly disclose a polymerization process involving the circulation of monomers in a slurry of polymer (fluff) partitioned off by movable separators (or the obstacles as claimed). Regarding the claimed "flowing a portion of the slurry through a bypass line extending from one location of the loop reactor to another location of the same loop reactor", Rouzier et al. (Figure 1; col. 6, line 51-55) disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor. Regarding the claimed "withdrawing a portion of the slurry from the loop reactor as a polymer product", Rouzier et al. (Figure 1; col. 7, line 6-8) disclose that portion of the slurry can be drawn off by means of a pump through line 43. For circulating the slurry, Figure 1 of Rouzier et al. clearly disclose the use of pumps (item 36, 39, 42).

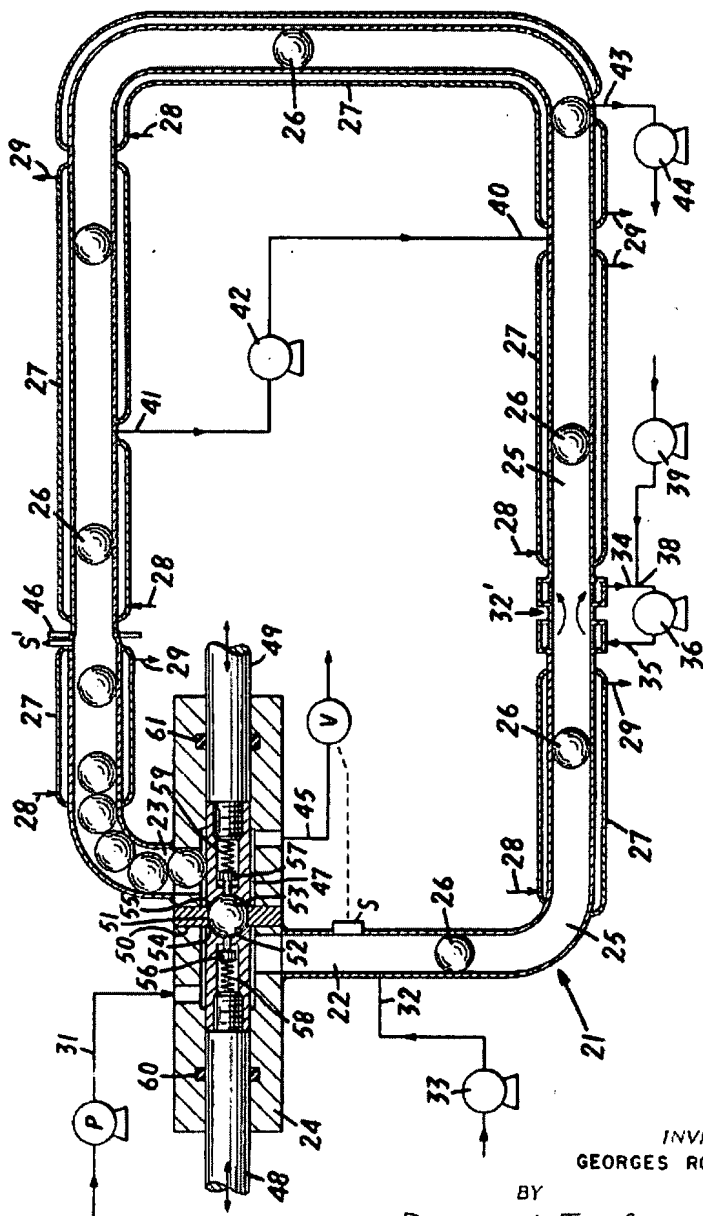


FIG. 1

INVENTOR.
GEORGES ROUZIER

BY
Brunnbaugh, Free, Graves & Donohue

The difference between the invention of claims 29-33 and Rouzier et al. is that Rouzier et al. do not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity".

However, Rouzier et al. in Figure 1 clearly disclose the use of pumps (item 36, 39, 42). Although Rouzier et al. do not disclose "circulating the slurry through the loop reactor at an efficiency of from 30-75% of a pump capacity", it would not be difficult to one of ordinary skill in art to recognize that the pump for circulating the polymer slurry should be run at a safe range or capacity within the capability of a pump to avoid equipment failure. Motivated by the expectation of success of developing a polymerization process for polymerizing ethylene, it would have been obvious to circulate the slurry at an efficiency that is not too low or too high capacity relative to the maximum capacity of a pump to obtain the a range that fully encompasses the 30-75% of a pump capacity feature as claimed.

Regarding the difference between the invention of claims 29-33 and Rouzier et al. that Rouzier et al. do not disclose that the recirculation of the slurry from the pressure side of the impeller blades of said pump to the suction side of the impeller blades of said pump, applicants must first recognize that Rouzier et al. in Figure 1 clearly disclose "flowing a portion of the slurry through a bypass line (item 41) through a pump (item 42) through line (item 40) to another location of the same loop reactor". Further, applicants must recognize that it is well know in the art that the pumps for this particular application are typical performed with pumps having impeller blades. While the impellers are in action for recirculating the said slurry, the action creates a suction side and pressure side. Further, on the pressure side, the slurry is being pumped to the

other side of the loop reactor to be recirculated. Portion of the recirculated slurry will be drawn to the suction side of the loop reactor.

Further, the difference between the invention of claims 29-33 and Rouzier et al. is that Rouzier et al. do not disclose perforated impeller blade.

Weinreich et al. (Figures 1-4; col. 3, line 1-10, line 26-34) disclose the use of perforated impeller blades to achieve violently agitation for mixing the contents that are being impelled. Motivated by the expectation of success of achieving better mixing, it would have been obvious to one of ordinary skill in art to incorporate perforated impeller blades, or impeller blades possessing holes within the blades, to obtain the invention of claims 29-33.

Regarding the claimed "total surface of the area of the holes in said impeller blades within a range of the total surface area of said blades", applicants must first recognize that Weinreich et al. (Figures 1-4; col. 3, line 1-10, line 26-34) clearly disclose perforated impeller blades for achieving violently agitation. Motivated by the expectation of achieving different level of violet mixing, it would have been obvious to one of ordinary skill in art to use "routine process optimization method" to vary the amount or the size of the holes in the perforated impeller blades to achieve different level of violet agitation to obtain the invention of claims 29-33. In view of the 112 rejection set forth for the recited "empty space", the examiner has a reasonable basis that the rationale set

forth for the rejection of claims 29-33 is adequate. Anyway, in view of the substantially identical type of perforated impeller blade for impelling a slurry comprising a polymer, the examiner also has a reasonable basis to believe that the claimed "empty space" is also inherently possessed by the working mechanism of the perforated impeller blades of Weinreich et al.

Conclusion

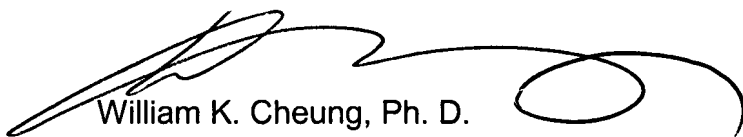
Any inquiry concerning this communication or earlier communications from the examiner should be directed to William K. Cheung whose telephone number is (571) 272-1097. The examiner can normally be reached on Monday-Friday 9:00AM to 2:00PM; 4:00PM to 8:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David WU can be reached on (571) 272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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William K. Cheung, Ph. D.

Primary Examiner

WILLIAM K. CHEUNG
PRIMARY EXAMINER

November 19, 2007